



Photo by Lane Hartill/CRS

In 2012, the Sahel faced a severe food security crisis for the fourth time in a decade. Poor rains, rising food prices and internal displacement caused by insecurity had placed almost 12 million people at risk of hunger, with no humanitarian aid. While countries such as Niger, Mali and Burkina Faso awaited their next harvest in November 2012, they faced a potentially worsening situation for six to eight months. In May and June of 2012, Catholic Relief Services (CRS) partnered with TANGO International to evaluate the severity of the situation and assess the efficacy of past projects on household resilience in the face of potential crisis.

RESEARCH QUESTION

This research was conducted to understand whether there were differences in “resilience” between vulnerable households in Niger that received development assistance including food distribution, agricultural training, nutrition training and livelihood strengthening, compared with vulnerable households that did not. Niger was chosen because of CRS’ long-time presence in the country and the ongoing implementation of USAID-funded multi-year assistance programs (MYAP).

CRS’ MYAP program included three strategic objectives: 1) protect livelihoods through increased agro- pastoral production and agro-enterprises; 2) improve health and nutrition status; and 3) protect resilience and ability to identify and respond to recurrent shocks. The interventions included:

- Training on agricultural production through the use of improved, drought-resistant crops, soil conservation, and livestock restocking
- Livelihood strengthening through agro-enterprise and income generation: processing and value-added, business planning, literacy training, income generating activities (IGAs)
- Natural Resource Management through land reclamation, irrigation trenches, half moon construction, Cash for Work/ Food For Work (CFW/FFW)
- Wat/San improvements through community led total sanitation, latrine construction, hand dug wells & drip irrigation

- Health and Nutrition training through behavioral change communication, training of community health workers, clinic rehabilitation, and food distribution

CRS identified four evaluation questions to assess household resilience:

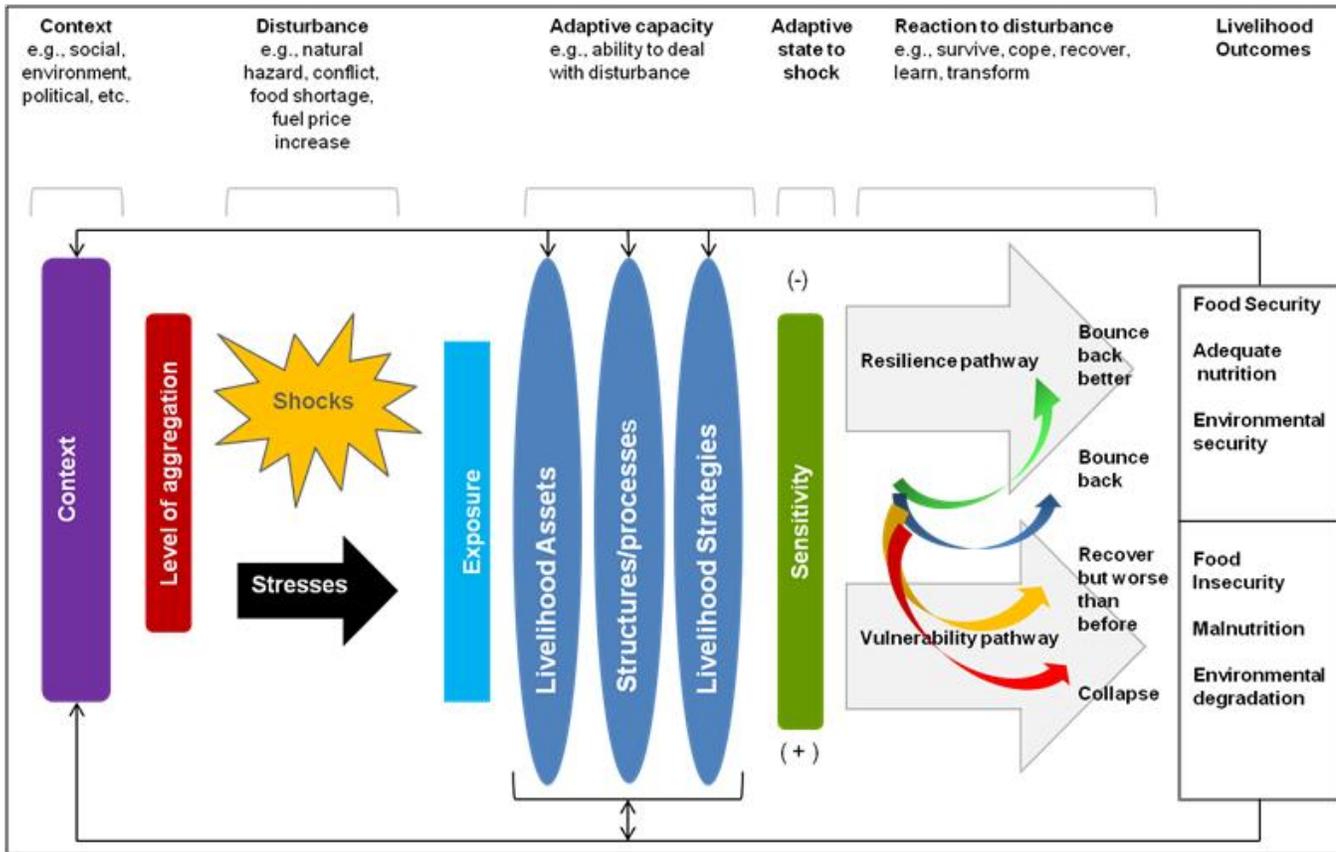
1. Are households participating in MYAP activities more food secure during crises than households that are not?
2. Do MYAP households consume higher quality foods than non-MYAP households?
3. Do MYAP households have greater assets that effectively buffer against shocks?
4. Are communities better equipped with social and physical infrastructure that mitigates shocks?

TANGO broadened the scope of the evaluation to include an analysis of risk management strategies used by households to cope with exposure to specific types of shocks. This aspect of the study focused on short-term adjustments and adaptive responses, and how these strategies affected food security and the ability to cope with future shocks.

METHODOLOGY

TANGO's resilience framework (see Figure 1, below) draws on a number of sustainable livelihoods frameworks¹, alongside existing disaster resilience frameworks and climate change adaptation approaches.

Figure 1. Resilience Assessment Framework



The analysis explicitly examines each of the components of the resilience framework laid out in Figure 1. The components include:

- 1. Adaptive capacity:** Adaptive capacity can be understood as the nature and extent of access to and use of resources in order to deal with disturbance (e.g., shocks or hazards) and longer-term trends (i.e., changing conditions). This deals with the ability to 'bounce back' from shocks and adapt to long-term trends. In the resilience framework, adaptive capacity is comprised of three interrelated elements – (i) livelihood assets; (ii) transforming structures and processes; and (iii) livelihood strategies.
- 2. Disturbance:** Disturbances may come in the form of rapid or slow onset shocks (i.e., natural or man-made hazards) such as earthquakes, drought, disease epidemics, pest outbreaks, and conflict, or longer-term stresses (e.g., environmental degradation, political instability, conflict, price inflation). By itself, a shock is not a disaster; it can, however, trigger a disaster because of underlying physical, social, economic or environmental vulnerabilities. A disaster occurs when households, communities, institutions or governments are unable to cope with a shock or stress². Some disturbances are idiosyncratic (i.e., affecting only certain individuals or households) whereas others are covariate (i.e., affecting an entire population or geographic area).
- 3. Reaction to disturbances:** Reactions to such disturbances listed above can include two general types: 1) adaptive strategies and 2) coping strategies. Adaptive strategies are those which households choose or change livelihood strategies, either in response to perceived long-term changes in exposure to shocks, such as being forced to reduce area farmed or grow less productive crops, or proactive changes, such as switching to more drought-tolerant crops or increasing irrigation, in response to protracted exposure to disturbances, such as growing exposure to drought. Coping strategies are short term adjustments such as temporary reductions in food consumption patterns, seasonal migration, or sales of household assets in response to exposure to a specific shock.

1 Frankenberger, T., Sutter, P., Teshome, A., Aberra, A., Tefera, M., Tefera, M., Taffesse, A.S., and T. Bernard. 2007. Ethiopia: The path to self-resiliency. Final Report prepared for CHF-Partners in Rural Development. July 2007 and Department for International Development (DfID). 1999. Sustainable livelihoods guidance sheets. London: DFID.

2 Pasteur, K. 2011. From vulnerability to resilience: A framework for analysis and action to build community resilience. Rugby: Practical Action.

4. Livelihood Outcomes: Livelihoods outcomes are the needs and objectives that households are trying to realize – or aspire to. Resilient individuals, communities and households are able to meet their food security needs, have access to adequate nutrition, have a protected environment, have income and health security, and are able to participate in the decisions that affect their lives. Vulnerable households experience deficits, or a high risk of deficits in each of these aspects. In the framework, a resilient pathway leads to positive livelihood outcomes, which can be measured as the ability to cope with shocks, to learn from the past and prepare for future shocks while remaining food secure, and therefore are in a position to move beyond poverty and food insecurity.

Using this conceptual framework, the study utilized both quantitative and qualitative methods.

The quantitative analysis includes two levels:

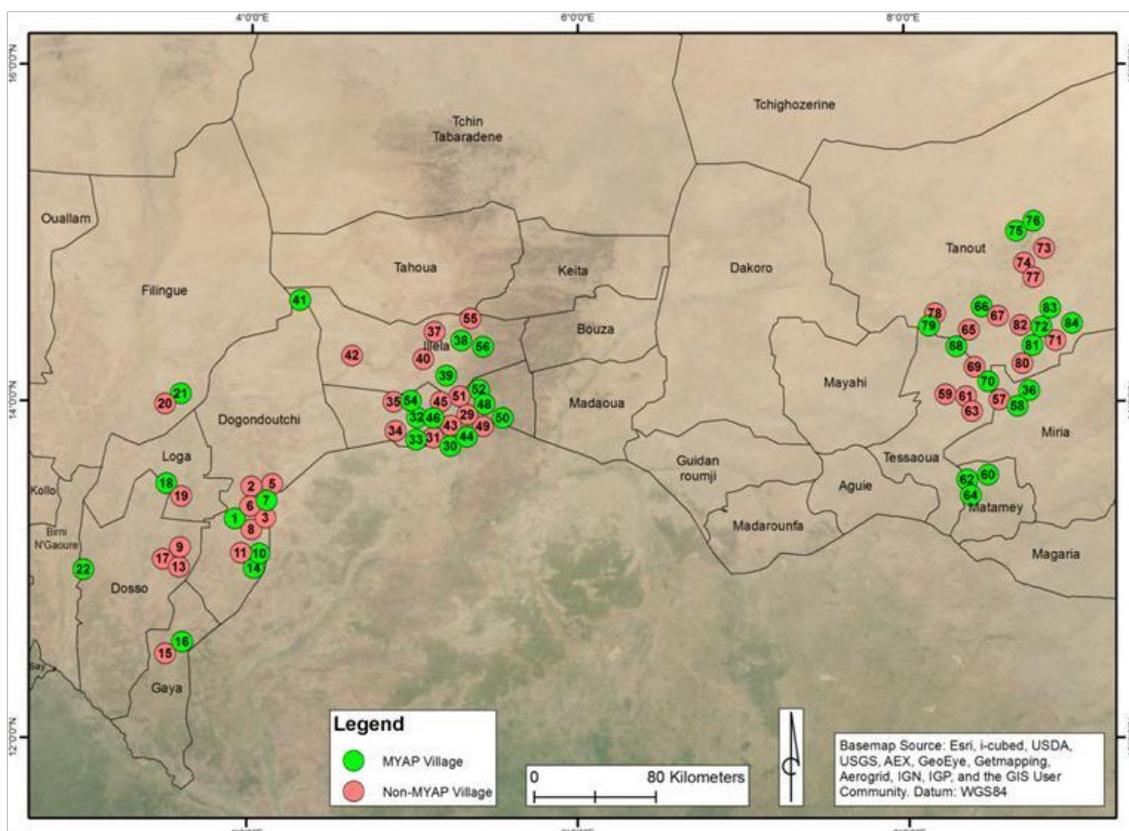
1. A basic comparison of food security outcome indicators between households that have received support from the MYAP and those that have not.
2. A more extensive multivariate analysis of resilience that analyzes how different types of households respond to specific shocks using various coping strategies, and how these risk management strategies affect both the current food security status and the likelihood that the households will experience food insecurity in the future. This analysis more accurately identifies the impacts of participation in MYAP on food security and vulnerability by controlling for other household and community-level characteristics.

The qualitative component offers descriptive information about what households considered to be the factors that determined and constrained their capacities to cope with shocks and stresses, as well as descriptive information about the community level structures and process which enabled or limited the possible adaptive responses of households to specific types of shocks

SAMPLING

The quantitative sample of households was designed to be a statistically representative sample of households within the MYAP project area. A total of 1,680 households were selected. The sample was stratified to include villages that received MYAP support and villages that did not, to serve as the control. A standard two-cluster study design was used resulting in a total of 74 selected villages in three regions (Dosso, Tahoua, Zinder), and 20 households selected from each sampled village.

Figure 2. Sampled Villages



From the overall sample of households, two appropriate comparison groups were defined: i) treatment group comprised of households in MYAP villages who reported participation in MYAP interventions (either CFW or training) and; ii) control group comprised of households in either MYAP or non-MYAP villages who reported no participation in CFW or any training activities of the type provided by the MYAP.

Data Analysis

To minimize problems of non-comparability of participant and non-participant control groups, either from targeting of program interventions or self-selection bias, propensity-score matching (PSM) was used to ensure that each household in the MYAP

participant group had a control group match with 'similar' demographic and asset related characteristics. Cases that could not be matched were excluded from the sample.

Also included in the study was a more extensive regression analysis of vulnerability to poverty that analyzed the factors affecting the probability that households with specific characteristics would fall below the poverty level in the future.

Overall the analysis is organized to explicitly examine each of the components of the resilience assessment framework, including adaptive capacities, disturbances, reaction to disturbances, and livelihood outcomes.



A man waters plants in a CRS dry season market garden in Jougola, Dogondoutchi district, in the Dosso region of Niger. The gardens are built through CRS cash-for-work projects, funded by CRS and USAID, which reclaim land and use simple irrigation techniques. *Photo by Tajiro Gouro/CRS*

RESULTS AND DISCUSSION

Analysis of the data examined the factors which influenced household adaptive capacities: assets and livelihood activities. The analysis also examined the other components of the resilience assessment framework, including the disturbance facing households, their response to shocks, and their livelihood outcomes which offer an understanding of the current well-being of the household.

ADAPTIVE CAPACITIES

Overall, the households in the three regions of Niger analyzed in this study exhibited limited adaptive capacities.

Assets

Assets are a critical component of household resilience. In some cases, they support productive activities or directly provide for household nutrition. In others, they serve as a buffer that allows for consumption smoothing when households experience shocks. Both theoretical and empirical evidence supports the notion that households with higher levels of assets demonstrate higher levels of resilience to shocks.

The study area is a poor region, and the research found that all households had few productive assets, including rain-fed and irrigated land, livestock, and non-productive household assets. The average amount of rain-fed land was less than one hectare per household (0.90), and irrigated land was even less (0.19 hectares). Little variation existed in the assets owned by the sampled households across income category, as measured by household expenditures per family member. Households in the lowest income category owned 0.92 hectares of rain-fed land, while households in the highest category owned 0.97 hectares. Ownership of cattle was low, with the average number of cattle per household less than one. Ownership of small livestock was higher across the sample, with households owning on average three to four sheep and /or goats. Higher income households owned more productive assets (7.5), such as tools and machines, as compared to lowest income households' ownership (6.4). These two groups owned the same number of large household

assets (2.2), such as a bed.

Among MYAP and non-MYAP households, MYAP households owned significantly³ more land, about one quarter hectare more of rain-fed land than non-participants (1.19 vs. 0.96 hectares), which may allow for a larger scale of agricultural production.

Off-Farm Income Generating Activities (IGAs)

Given the severity of the ecological situation within the study area, with recurrent drought and economic shocks persisting over the last decade in the Sahel region of Niger, households must find alternative ways to generate income to purchase food when subsistence farming is insufficient to feed the household.

The number of income-generating activities undertaken by households was low overall. Further, the average number of different types of IGAs over the entire sample was less than one (0.65). The varying income groups showed a limited difference between IGAs, ranging from 0.6 per household in the lowest income group to 0.8 in the highest.

The data showed no significant difference between MYAP and non-MYAP households for the average number of household IGAs, and the types of IGAs between the groups are similar, including livestock sales (35 percent) and trade (28 percent). However, the research found that participant households, who received training in enterprise development are significantly more likely⁴ than non-beneficiaries to report having income-generating activities (41.8 vs. 31.9 percent). Also a small proportion (5.2 percent) of the sample earned cash from handicrafts, of which MYAP participants were significantly⁵ more engaged than non-participants (6.9 vs. 2.8 percent). The evidence from this survey suggested that households with more IGAs had more sources of income, which helps to reduce exposure to risk, which implies they would be less likely to fall into poverty over time and could therefore be considered as more resilient. MYAP activities that increased IGA participation are likely to have helped increase resilience through diversifying livelihood sources.

Table 1: Household engagement in income-generating activities, by participation group

Indicator	MYAP PARTICIPATION		
	Participant	Non-participant	Total
% households with any IGA	41.8*	31.9	36.9
Average # of IGAs per household	1.28	1.39	1.33
Type of IGA			
Livestock sales	31.9	39.4	35.2
Trade	28.4	27.6	28.1
Handicrafts	6.9*	2.8	5.2
Small business	3.2	3.3	3.2
Hired labor	1.6	1.2	1.4
Wood sales	1.6	1.2	1.4

Note: * indicates that the proportion is significant at $p < .05$ between participants and non-participants

3 Significant at the <0.05 level.

4 Significant at the <0.05 level.

5 Significant at the <0.05 level.

DISTURBANCES AND SHOCKS

Households were surveyed to determine their exposure to various shocks over the past ten years. Surprisingly, given the extremely variable conditions in Niger, a relatively low proportion of households reported being exposed to specific shocks. Only 60 percent of households reported being exposed to drought in the past ten years, despite having faced at least one major drought in 2010. The next most frequently cited shock was increase in food prices, but less than 40 percent of respondents reported this shock. All other types of shock were cited by less than 15 percent of households.

These low numbers in the context of Niger, suggest that households may be becoming increasingly habituated to the shocks that they regularly experience. The recurring variations in weather and economic conditions may mean that the people now consider harsh conditions to be their new “normal,” and now only consider extreme instances to be shocks.

REACTION TO SHOCKS

Coping Strategies

Few types of coping strategies were used to deal with shocks. The most common strategies were eating less food, and eating lower quality food. The next most common strategy was to sell non-productive assets, followed by getting help from others. All other coping strategies were reported by less than 10 percent of households. The same pattern of general coping strategies was observed with coping strategies in response to specific shocks.

MYAP participants employed fewer negative coping strategies in the face of shock. Participant households were more likely to report a safety net on which they could rely (Government, NGO, or CFW) to protect against ruinous outcomes compared with non-participants. MYAP beneficiaries were also more likely to report risk reduction activities in the form of an IGA. Together, these measures contribute to findings that show MYAP beneficiaries are less likely to sell land (an irreversible

strategy) or to send an adult away temporarily, and are planning and taking actions to avoid the worst effects of shocks, as compared with non-participants.

Adaptive Strategies

The study examined adaptive strategies by asking questions about changes that households had made in agriculture and IGAs, and the reasons why they made these changes. In agriculture, about 20 percent of households reported making positive changes, such as using new inputs or changing crops, with a higher percentage making changes in higher economic categories. Only one percent of households reported negative adjustments in their agricultural activities. The reason for adopting new activities was that they provided higher returns (more profitable), while only a small proportion reported adopting new activities in order to reduce risk. The findings suggest that households do not seem make conscious decisions about their livelihood activities as strategies to reduce their exposure to risks or they did not easily associate diversification with risk management, but understand the merits of higher incomes and multiple sources of income.

An analysis of adaptation shows that MYAP interventions contributed to household resilience through agriculture and structural changes in livelihood strategies in response to shock. A significantly higher proportion⁶ of project participants reported having adopted positive agricultural technology investments than non-participants (24.5 vs. 15.6 percent). MYAP participants were also significantly⁷ more likely to report plans to adopt positive agricultural changes in the future as compared to non-participants (84.3 vs. 77.0 percent). MYAP participants were significantly⁸ more likely to report plans to increase production through techniques such as using new inputs for the future (56.5 vs. 29.6 percent) or adding irrigation (8.7 vs. 1.1 percent). This evidence suggests that agricultural based interventions, particularly training, led to the acquisition of news skills which influenced household behavior and significant positive impacts for added resilience.

Table 2: Actual and planned changes in agriculture, by participation group

Indicator	MYAP PARTICIPATION		Total sample
	Participant	Non-participant	
Positive agricultural changes	24.5*	15.6	20.4
Plan to increase agricultural activities	84.3*	77.0	80.7

Note: * indicates that the proportion is significant at $p < .05$ between participants and non-participants

Positive changes: more profitable, less risk, adopted newly available technologies, learned new technologies, adopted more drought/flood/salt tolerant crops, able to purchase new inputs from loans or savings

6 Significant at the <0.05 level.

7 Significant at the <0.05 level.

8 Significant at the <0.05 level.

LIVELIHOOD OUTCOMES

In comparison with the information about assets and livelihood activities, there is more variation in outcome variables.

Household Expenditure

Annual household expenditures per family member ranged from USD \$80 in the lowest economic category of households to USD \$1,200 in the highest. The measures of food access, the household dietary diversity score, food security and household hunger score, also show marked differences from the lowest to the highest economic categories.

Dietary diversity

Dietary diversity was relatively low for both MYAP and non-MYAP households. However, MYAP participants reported consuming significantly⁹ more diverse diets

than their counterparts (4.39 v. 4.04). This is despite the fact that annual per capita expenditures were statistically insignificant between the two groups. Thus, although participant and non-participant households have similar levels of expenditure, participant households exhibited more diversified diets. This difference thus may reflect the impacts of nutrition training.



Women in Doutchi, Niger, are participating in a CRS cash-for-work program, funded by USAID and CRS, to build soil and water conservation structures on degraded land in their village. *Photo by Tahiro Gouro/CRS*

Table 3: Household Hunger Scale, Household Dietary Diversity Score, and per capita expenditure, by participation group

	MYAP PARTICIPATION		Total Sample
	Participant	Non-participant	
Household Hunger Scale Categories (% of HH)			
Little/none	73.4	73.2	73.3
Moderate	23.9	23.9	23.9
Severe	2.3	2.5	2.5
Household Dietary Diversity Score			
Mean score	4.39*	4.04	4.22
Annual per capita expenditure			
FCFA	185,176	196,118	196,118

Note: * indicates that the proportion is significant at $p < .05$ between participants and non-participants

Vulnerability to Poverty Model Analysis

Application of the vulnerability to poverty model provided only limited predictive explanatory power (6%) about the vulnerability of specific households and the factors that would make them liable to fall into poverty in the future. In this analysis, the statistical model was not able to distinguish the effects of different household characteristics and this may have been due to the limited levels of variation in household adaptive capacities, exposure to shocks, and adoption of coping strategies, in the context of Niger.

⁹ Significant at the <0.05 level.

SUMMARY AND RECOMMENDATIONS

The analysis examined how households were able to react to shocks and disturbances, and the extent to which different types of project interventions have been able to enhance their resilience through adaptive capacities. This was done by looking at how interventions have reduced household reliance on negative coping strategies.

Through this research, the following recommendations can be made regarding the implementation of programs to best build resilience for the future.

RECOMMENDATIONS FOR BETTER RESILIENCE PROGRAMMING

Cash for Work/Food for Work is an effective short-term mechanism for maintaining resilience.

CFW/FFW has been shown to protect households from resorting to destructive coping strategies such as migration of household members and sales of household assets, and it also relieves families from reducing the quantity and quality of food they eat. The support of government and NGOs such as CRS through a direct transfer of a basic necessity to households is a costly and short-term strategy. However, this type of action avoids the more negative coping strategies and maintains dietary health of the most vulnerable. Understanding the context of shocks and the existing household and community strategies will help support institutions to better place CFW/FFW responses when they are most effective and continue to build resilience during times of shock.

Training for agricultural and non-agricultural activities can improve and diversify incomes to enhance resilience for the long-term.

An increased number of income sources can reduce exposure to risk and enhance household resilience, as

measured by reducing the vulnerability to poverty. Training in market focused agriculture, or “agro-enterprise,” helps households to enhance their livelihoods through improved investments in crops and livestock, IGAs and marketing, increasing their incomes from available resources. Future programs should continue to make long-term investments in both agricultural and non-agricultural market based training to generate more sustainable ways to diversify and increase incomes.

Increasing non-agricultural income streams can also improve resilience.

The low proportion of non-agricultural IGAs suggests another possible direction for resilience programming. However, this option faces many challenges in Niger, where households are very widely dispersed geographically and access to markets, infrastructures, and capital are limited. Creative strategies to find opportunities within these constraints are needed.

Risk management is an important aspect of resilience building, and can be embedded into resilience programs.

Households did not articulate a conscious decision-making process about livelihood strategies in order to minimize or spread risks with regard to different types of shocks. Framing NGO activities geared towards change as “risk management” may lead to more explicit decision making by households in the face of shifting environments, such as cyclical drought or flooding. Future programs should expose household to concepts of risk management and provide livelihood options that allow households to spread their risks across different activities, which can provide households with significant opportunities to enhance their resilience.



This study was carried out by TANGO on behalf of CRS. For more information on CRS and resilience, contact pqpublications@crs.org

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